Broadcast Signal Lab

Radiofrequency Energy Survey

Clear Channel FM WHCN, WKSS, WPHH, & WWYZ

Meriden, CT August 17, 2005

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Report on Radiofrequency Energy Survey at Clear Channel site on West Peak in Meriden, CT

1. Introduction

Broadcast Signal Lab performed a radiofrequency energy survey at the West Peak transmitter sites of WHCN, WKSS WPHH and WWYZ (main and auxiliary) owned by Clear Channel Broadcasting in Meriden, CT. Measurements were made on August 17, 2005 by David K. Peabody. The survey was conducted to verify compliance with applicable Federal Communications Commission (FCC) requirements for power density. Several other frequencies are in operation at this site.

Testing was conducted using a NARDA monitor Model no. 8711, Serial no. 01001. It was fitted with an ultra-broadband isotropic probe Model no. 8722, Serial no. 03017. This configuration observes all frequencies from 300 kHz to 40 GHz. This instrument outputs power density levels as a percentage of the American National Standards Institute (ANSI) standard Radiofrequency Protection Guide (RFPG). In the event that a variety of frequencies are in use, as at collective or shared sites, this instrument will automatically weight each component according to its relative share of the ANSI curve. Corrections as supplied by the instrument's manufacturer, the Narda Microwave Corporation, at the time of last calibration, January 2004, were applied to the data. In general, the manufacturer's corrections show the instrument complies with the ANSI curve within plus or minus 1.8 dB (a factor of between 2/3 and 3/2).

The 8711-8722 monitor-probe combination employed in making these measurements reads far-field equivalent plane-wave power density of the electric field. We did not make measurements of the magnetic field as such. We believe there would be no significant difference in the outcome of the survey based on magnetic rather than electric field readings in the present context and it is sufficient to measure only one such parameter to define in broad terms the areas in which exposure might approach or exceed the guideline limits. The probe is used at heights between 3 and 7 feet unless otherwise stated. The results are given in percentage of RFPG.

Effective January 1997, per Report and Order 96-326, the FCC adopted the 1986 National Council on Radiation Protection and Measurements (NCRP) exposure guidelines. For occupational/controlled exposure areas the NCRP limit is 100% of RFPG. 100% of RFPG also corresponds to the FCC maximum average for six-minute occupational exposure. For general public/uncontrolled exposure areas, the NCRP curve is at 20% of RFPG or greater, depending upon operating frequencies. At the operating frequency of all FM broadcast stations, levels of 20% of RFPG is the general population/uncontrolled maximum permissible exposure under the NCRP (federal) guidelines. Due to the presence of multiple stations at this site and utilizing the least lenient of the NCRP guideline for the presence of multiple stations operating between 88 and 108 MHz levels exceeding 20% of RFPG would indicate non-compliance with FCC federal public exposure limit guidelines. In terms of power density between 88

and 108 MHz, 100% of RFPG corresponds to 1 mW/cm² and 20% of RFPG to 0.2 mW/cm².

The additional communications services can be grouped into several classes and the actual power density, which corresponds to 100% of RFPG and 20% of RFPG, can be calculated.

Service	Frequency Range	P@100% RFPG	<u>P@20% RFPG</u>
VHF paging and two-way	30 to 300 MHz	1 mW/cm ²	0.2 mW/cm ²
Low UHF two-way	300 to 900 MHz	1-3 mW/cm ²	0.2-0.6 mW/cm ²
Mid UHF paging	900 to 2000 MHz	3-5 mW/cm ²	0.6-1 mW/cm ²

The FM broadcast stations on West Peak are as follows:

Station ID	Operating Frequency in MHz	Effective Radiated Power (e.r.p.) In kW
WPKT	90.5 MHz	13.5 kW
W220CE	91.9	0.001 kW
WWYZ	92.5 MHz	17 kW
WZMX	93.7 MHz	17 kW
WKSS	95.7 MHz	16.5 kW
WDRC	102.9 MHz	19.5 kW
WPHH	104.1 MHz	18 kW
WHCN	105.9 MHz	16 kW

The additional communications services active within the WHCN building are as follows:

Location	Owner/Operator	Frequency in MHz
WHCN Tenant Room	NOAA Weather Radio	???
	Metrocall Paging	???

The additional communications services active within the WWYZ(main) building are as follows:

Location	Owner/Operator	Frequency in MHz
WWYZ(main) Tenant Room	Pagenet 5 transmitters	???
WWYZ(main) Nextel	Nextel not accessible	????

The additional communications services active within the WWYZ(auxiliary) building are as follows:

Location	Owner/Operator	Frequency in MHz
WWYZ(auxiliary)	CiaToo	901.20625
Tenent Room	SigTec Cipher MRS61 & BRS29	???
	Metrocall KNKL616	931.6125
	KNKJ921	931.0625

The additional communications services active within the WKSS/WPHH compound are as follows:

Location	Owner/Operator	Frequency in MHz
Nextel Room	Nextel not accessible	????

The Clear Channel transmitter buildings on West Peak are WHCN, WWYZ (main), WWYZ (auxiliary), WKSS and WPHH. The WDRC/WHCN/WWYZ(main) compound contains one other transmitter building owned by Algonquin Gas. No access was provided to the interior of the Algonquin Gas building. Examined as part of this report are the common compound of WDRC/WHCN/WWYZ(main), the compound of WWYZ(auxiliary), and the compound of WKSS/WPHH.

The interiors of WDRC and WZMX/WPKT buildings were examined and are reported in their documents. The WZMX/WPKT compound on the West Peak site is subject to it's own testing and reporting requirements.

2. Description of site

The transmitter sites are several locked and gated compounds and transmitter buildings along West Peak Drive in West Peak State Park in Meriden, Connecticut. The compounds are arranged from south to north along a ridge. The subject compounds surveyed for this report are WKSS/WPHH, WWYZ(auxiliary), WZMX/WPKT, and WHCN/WDRC/WWYZ(main). The public area surrounding these compounds was also examined.

Each of the subject compounds is surrounded by cyclone fence with lockable gates. Appropriate signs/posting for the radiofrequency exposure are present. The sites are well maintained.

One area of exception was noted. The fence around the WWYZ(auxiliary) compound does not completely surround this compound. There exists a roughly 30-foot gap along the cliff on the southwest side. An energetic or mischievous hiker could easily gain access to this compound by walking around the end of the fence. Once there however he would find a locked transmitter room door, and fenced and locked tower base.

3. Survey data

Examinations were made with all stations operating in normal operating mode on their main antennas, except WWYZ during the minutes when examination of WWYZ(auxiliary) were taking place. At that time, WWYZ(auxiliary) was powered up into its antenna.

3a.(1) WHCN Transmitter Room

The WHCN transmitter room contains Harris Z10CD analog main transmitter, an Harris Z8HD digital main transmitter and equipment racks. Examinations were made with WHCN operating on the main transmitters; the auxiliary transmitter was not operating. Monitor levels of <1% of RFPG were observed throughout. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the main transmitter. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the digital transmitter. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the RF combiner. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the heliax section on the transmission line. No other hot spots or points of leakage were found.

3a.(2) WHCN Rental Room

This room contains the equipment previously listed in section 1 of this report. Monitor levels of <1% of RFPG were observed throughout. Monitor levels of 10% of RFPG were observed within 20 centimeters (8 inches) of the NOAA and Metrocall equipment racks. No hot spots or points of leakage were found.

3b.(1) WWYZ(main) Transmitter Room

The WWYZ transmitter room contains a Continental 816R-2B analog main transmitter, an Harris M4HD digital main transmitter and equipment racks. Examinations were made with WWYZ operating on the main transmitters. Monitor levels of <1% of RFPG were observed throughout. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the main transmitter. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the digital transmitter. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the transfer switch. Monitor levels of 2-5% of RFPG were observed within 20 centimeters (8 inches) of the heliax section on the transmission line and the harmonic filter. No other hot spots or points of leakage were found.

3b.(2) WWYZ(main) Rental Room

This room contains the equipment previously listed in section 1 of this report. Monitor levels of <1% of RFPG were observed throughout. Monitor levels of <1% of RFPG

were observed within 20 centimeters (8 inches) of all thr Pagenet transmitters. No hot spots or points of leakage were found.

3b.(3) WWYZ(main) Nextel Room

Examination of the Nextel room was not possible. No access was granted to WWYZ or this examiner.

3c.(1) WHCN/WDRC/WWYZ(main) Compound Interior

The enclosure was examined in an 6 foot gird pattern with extra attention given when monitor levels exceeded the public limit (20% of RFPG).

Monitor levels of 3-15% of RFPG were observed within the WHCN/WDRC/WWYZ Main enclosure. Two areas were observed where monitor levels exceeded the public limit. Along the top of the retaining wall abutting northeast corner of the Algonquin Gas building, monitor levels of 30 % of RFPG were observed in a 5 foot circular area. Along the north side of the LPG storage tank, monitor levels of 30-40 % of RFPG were observed. No other hot spots or points of leakage were found.

3c.(2) WHCN/WDRC/WWYZ(main) Compound Exterior

In the past one area of concern had been found along the roadway due east of the WDRC tower adjacent the fence.

Monitor levels of 5-15% of RFPG were observed in the public areas surrounding the compound. Monitor levels of 15% of RFPG were observed in one spot on the roadway due east of the WDRC tower.

No other hot spots or points of leakage were found.

3d.(1) WWYZ(auxiliary) Transmitter Room

The WWYZ(auxiliary) transmitter room contains a Harris FM20k analog main transmitter and equipment racks. Examinations were made with WWYZ operating on the auxiliary transmitter. Monitor levels of <1% of RFPG were observed throughout. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the main transmitter. Monitor levels of 2-5% of RFPG were observed within 20 centimeters (8 inches) of the transmission line and the harmonic filter. Monitor levels of 2-5% of RFPG were observed within 20 centimeters (8 inches) of the overhead AC power conduit. No other hot spots or points of leakage were found.

3d.(2) WWYZ(auxiliary) Rental Room

This room contains the equipment previously listed in section 1 of this report. Monitor levels of <1% of RFPG were observed throughout. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of all the transmitters. Monitor levels of

2-5% of RFPG were observed within 20 centimeters (8 inches) of the overhead electrical power equipment. No hot spots or points of leakage were found.

3d.(3) WWYZ(auxiliary) Generator Room

Monitor levels of 7% of RFPG were observed within the generator room. No hot spots or points of leakage were found.

3d.(1) WWYZ(auxiliary) Compound

Due to the fact that the fence does not completely surround the compound rendering the compound effectively a public area, examinations from inside the WWYZ compound fence are reported here. Monitor levels of 5-15% of RFPG were observed inside the compound. No other hot spots or points of leakage were found. With WWYZ(auxiliary) operating it's antenna, examinations were made of the interior of the WWYZ(auxiliary) compound. Monitor levels of 5-15% of RFPG were observed inside the compound. The 15% of RFPG was measured at a knoll 25 feet south of the entrance door to the WWYZ(auxiliary) building. No other hot spots or points of leakage were found.

3e.(1) WKSS/WPHH Transmitter Room

The WKSS/WPHH transmitter room contains a Harris Z10CD WPHH analog main transmitter, a Harris Z8HD WPHH digital transmitter, a Harris Z10CD WKSS analog main transmitter, and a Harris Z8CD WKSS digital main transmitter, Harris Z10CD WPHH/WKSS analog auxiliary transmitter, and equipment racks. The auxiliary transmitter was not operating during examination. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the transmitters. Monitor levels of <1% of RFPG were observed within 20 centimeters (8 inches) of the 1 % inch hard transmission line. Monitor levels of 3% of RFPG were observed within 20 centimeters (8 inches) of the 3-inch hard transmission line. Monitor levels of 2% of RFPG were observed within 20 centimeters (8 inches) of the 1%-inch heliax transmission line. Monitor levels of 3-4% of RFPG were observed within 20 centimeters (8 inches) of RFPG were observed within 20 centimeters (8 inches) of RFPG were observed within 20 centimeters (8 inches) of RFPG were observed within 20 centimeters (8 inches) of RFPG were observed within 20 centimeters (8 inches) of RF Filter #1 and RF Filter #2. No other hot spots or points of leakage were found.

3e.(2) WKSS/WPHH Electrical Power Room

This room contains the electrical power equipment. Monitor levels of 1-2% of RFPG were observed. No hot spots or points of leakage were found.

3e.(3) WKSS/WPHH Storage Room

The area is located in a separate building from the room examined in the previous 2 sections. Monitor levels of <1% of RFPG were observed. No hot spots or points of leakage were found.

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3e.(4) Nextel Room

The room is also located in the separate building referred to in section 3e.(3). Examination of the Nextel room was not possible. No access was granted to WWYZ or this examiner.

3e.(5) WKSS/WPHH Compound

The enclosure was examined in an 6 foot gird pattern with extra attention given when monitor levels exceeded the public limit (20% of RFPG).

Monitor levels of 1-5% of RFPG were observed within the WKSS/WPHH enclosure. No hot spots or points of leakage were found.

3f. Roadways and woods surrounding the compounds

Where the undergrowth permitted and along public pathways and roads around the facility, examination were made from the compounds out to a maximum distance of 150 feet. In relatively open areas examinations were made in lines along a north-south axis 15 feet apart. Extensive examinations were not made along the west face of the site due to the fact the west side of the compounds abuts a cliff. Where possible, the west side of the fence was examined.

Monitor levels of <1 to 15% of RFPG were observed in the public areas surrounding the compounds. Three specific areas where monitor levels were 10% of RFPG or above are: the rock outcropping due north of the WWYX(auxiliary) compound at 10% of RFPG, a small knoll due east to the WDRC tower at 15% of RFPG, and area between WZMX/WPKT compound and the WHCN/WDRC/WWYZ compound at 15% of RFPG. No other hot spots or points of leakage were found.

4. Discussions and Recommendations

Radiofrequency energy (RFE) exposure is governed by FCC regulations.

The FCC, having adopted exposure guidelines in Report and Order 96-326, and pursuant to 47 CFR 1.1310, offers guidance in dealing with general population/uncontrolled exposure and occupational/controlled exposure in its Office of Engineering and Technology Bulletin 65 (OET65). Under OET-65 the acceptable methods for controlling exposures range in complexity, with no requirement or preference for any particular means of compliance in any situation, except to effectiveness to the given site¹. Simple barriers such as "fencing and posting or locking out unauthorized persons", are acknowledged as sufficient in general

¹ Federal Communication Commission, Office of Engineering and Technology, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65 (Edition 97-01), Section4: Controlling, pgs. 55-57

population/uncontrolled exposure" ² areas, to prevent the exposures levels from exceeding the federal general population/uncontrolled exposure limits. In occupational /controlled exposure areas, where exposure levels may exceed the occupational limits (equal to100% of RFPG), controlling exposure may consist of any or all of the following: simple posting (e.g., "Keep Back X feet"), non-conductive physical barriers (additional fencing), individual training; or while work is being performed in those areas: lowering transmitter power, protective clothing, or shutting transmitter off (Lockout-Tagout) ³. Planning to avoid exposure beyond the maximum permissible exposure levels (MPE)⁴ may include limiting actual time spent in the restricted area for an acceptable time-averaged exposure.⁵

At the operating frequency of all FM broadcast stations, the federal general population/uncontrolled maximum permissible exposure limit is 20% of the federal occupational/controlled exposure limit. The federal occupational/controlled exposure limit is 100% of RFPG.

According to the measurements reported here, utilizing the least lenient standard (20% of RFPG), the West Peak Clear Channel sites have a few areas where this public exposure limit is exceeded. These areas are specific points within the WHCN/WDRC/WWYZ(main) compound.

According to the measurements reported here, utilizing the federal occupational/controlled maximum permissible exposure limit (100% of RFPG), the West Peak WZMX/WPKT site does not have any areas measures where this occupational/controlled maximum permissible exposure limit is exceeded.

The areas at the West Peak Clear Channel sites and facilities where this public exposure limit is exceeded are already secured as occupational areas. These areas are within the fenced enclosures. For federal compliance, these areas are secured by fences and signs and are considered occupational/controlled exposure areas, not general population/uncontrolled exposure areas. These areas are considered occupational or occupational/controlled exposure areas as they are not accessible to the public or, presumably, to untrained personnel.

In accord with OET-65, any area where an individual may be exposed in excess of the general population/uncontrolled exposure limit must be designated a "restricted area" and be accessible only to workers who are "aware of" and can "exercise control over" their exposure. Even persons who are only transient visitors to these locations, such as electricians, painters, and landscapers, could be allowed access under the

<fcc.gov/Bureaus/Engineering/_Technology/Documents/bulletins/oet65.pdf>

² ibid., Section4: Controlling, pg. 52

³ Federal Communication Commission, Office of Engineering and Technology, *Evaluating Compliance* with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65 (Edition 97-01)., Section4: Controlling, pgs 55-57

⁴ ibid., Appendix A., pgs 64-66

⁵ ibid., Section 4 Controlling., pgs 55-56

occupational/controlled exposure criteria as long as they are "made aware" of their exposure and "exercise control" over their exposure.⁶

The only other area at the West Peak Clear Channel sites and facilities in which radiofrequency energy levels are likely to exceed 100% of RFPG is on the tower. It is recommended that for compliance with the FCC requirements, standard "RF radiation area" warning signs be maintained around the tower, with explicit instructions to stay off the tower unless exercising appropriate exposure control.

The criteria for complying federal RF exposure standards, which involve training, and day to day site management are not within the scope of this report. This report evaluates the site and facility for areas of possible exposure and considers only the criteria that relate to securing and posting relevant areas. For training, Broadcast Signal Lab stands ready to assist the facility operator. Other guidance may be obtained from proper regulatory authorities or, where available, corporate engineering and legal sources.

Broadcast Signal Lab recommends the maintenance of all existing signs. Broadcast Signal Lab recommends the adoption of a radiofrequency exposure policy and the familiarization of all employees with that policy. Such a policy should include detailed descriptions of the site and any exposure hazards contained therein as well as procedures for minimizing exposure in at-risk areas. The policy should be written, maintained, and posted where relevant employees have easy access to it.

All West Peak Clear Channel stations, WCHN,WKSS, WPHH, WWYZ(main) and WWYZ(auxiliary) appear to be compliance with all applicable statutory and regulatory requirements for radiofrequency exposure.

The preceding report is to my information and belief true and correct.

October 21, 2005

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⁶ ibid., Section 4: Controlling., pp55.